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SAFEGUARD FOR VEHICLE USING LoRa

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Abstract*— In day today life there is rapid increase in vehicles and also technologies. In such case we took a survey for vehicle theft and that plays a major role in the world. Even though technology increases as much as the crime increased in the city. Many complaints regarding vehicle theft so we planned to reduce the theft by safeguarding the vehicle from the robbers. In this project the vehicle cannot be accessed without the permission of the users. Biometric sensor, unique identity of each person is attached with the key holder. To start the engine, we need to access the users fingerprint then only the vehicle can be started or else if the fingerprint doesn't match it denies the access of the vehicle by locking the fuel port that will not send the fuel to the engine from the petrol tank and sends the alert to the user by using long range device LORA and its range is above 8kms and when someone interrupted, then the user's vehicle will lock automatically from where he is located through his device. Not only sending alert information, it also sends the live location of the vehicle to the user and to the Internet cloud storage that we can access from anyplace to locate the vehicle

***Keywords*—Biometric Sensor, LORA module, GPS module, ARM microcontroller (stm32f103c8t6), Vehicle Theft Alert alarm**

I. INTRODUCTION

An Anti-Theft System is device used to prevent or detect the unknown persons of items Considered valuable [1]. The **SAFEGUARD FOR VEHICLE USING LORA** that to introduce as a new device and it plays the major role on security systems for vehicle. It is mainly initialized to secure the vehicle from theft, shares the location, Alert the owner and locks the fuel port. The hacking has been a big problem since the conception of idea of privacy. Many control systems have been designed to prevent unapproved access. It is important to have a stress-free and convenient means of achieving privacy and safe guarding our vehicles. Many security systems were deployed by us to protect from theft [1]. As lifestyles around the world are getting plush, the need to design and prevent unauthorized access to our resources in a sophisticated system is very important and is feasible in the long run. The Security System's performance specifications are- buzzer initiation, LED notification, notifies owner with email attachment, detecting a person, and automatic enabling/disabling [1]. The idea of LoRa is **Lo**ng **Ra**nge, low data rate and low power with the wireless platform technology for building IoT network. LoRa technology is owned by a chip, we have designed a vehicle security surveillance system using ARM microcontroller as the brain of our prototype which controls the LORA module, the fingerprint module, sensors and other components. We have given features like live location share and email notification, alarm in case of any intrusion and lock feature.

II. LITERATURE REVIEW

To avoid vehicle theft there are already many methods already introduced from nineteenth century. According to their operation they are divided as tracking method of vehicle and other is biometric method, in biometric they are further subdivided on the basis of "Biometric Authentication" type such as finger, eye, face etc.

Tracking Method : In recent years many techniques and ideas are evolved for Vehicle safety or to avoid vehicle robbery. These are use of GPS ("Global Positioning System") sensor which Provides position of vehicle in altitude and longitude [3]. Then this information is transferred over wireless medium to owner or cop. That Wireless transmission mostly done using the GSM ("Global System for Mobile Communication") module [1][3]. Below diagram figure 1 can give brief idea about it.

III. PROBLEM DEFINITION

The Tracking of the vehicle and capturing the image of the intruder when he starts to access the vehicle and matches the intruder face with the owners face that already stored in the database, when it doesn't match then the intruder image will be captured and send through Email to the owner and stops the access of the vehicle [3]. The Image Capturing system plays the major role in this system, in such case it is used by Open CV (Open Source Computer Vision). In this the owner's image is already taken with different gestures and stored in the database. We cannot give assurance that it identifies the right person. Once the face is like owners then it will allow to access the car. And also if owner is registered his face without beard and it is tough to identify the owners face when he is with beard [1].

IV. PROPOSED SYSTEM

Proposed solution is conceptually much simple. The Idea behind it is, a providing low cost, less complex, highly reliable and most importantly user friendly to implement as well as handle for man. The person accessing the vehicle must get identified first and then authorized. The following embedded system is proposed with increased simplicity and Functionality.

A. Block Diagram

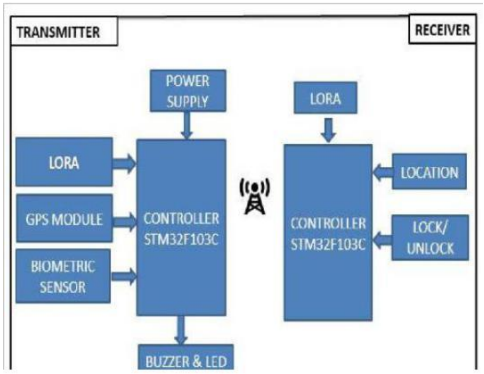


fig 1: proposed system using unique identity

***Owner device*:** It is complete user or owner part who is actual authorized person. That owner has already registered his fingerprint with the system. Device means it could be the mobile or the receiver device from where user can access an email account and Gps for location.

***Proposed System*:** In our proposed system we don't need any network to transmit the data and to receive the data we have modified with LORA that can transmit more than 10kms distance. We don't want to suffer for network should be available and the unique identity of every single person to register fast and simple is that one and only the finger print and we modified our biometric in case of user friendly and highly secure device we have selected finger print scanner and if the intruder tries to start the car without registering his finger vehicle cannot be accessed .we have highly modified our design to protect from theft .the intruders finger doesn't matches and live location and vehicle access will be denied fuel port of the vehicle will be locked and alarm sound will be increased with high volume.

Finally, it is highly secured, no need of any network only transmitter (vehicle) and receiver (user's device) is enough to be acquire the information. Proposed system consists of physical or wired and also the wireless medium.

***B. Software Information Arduino**:*

Arduino board is a micro controller board which runs the program, there's no OS, just code. The Arduino itself has no real operating system. We develop code for the Arduino board using Arduino IDE. That is simple and innovative to add our coding with simple C programming.

C. Flowchart

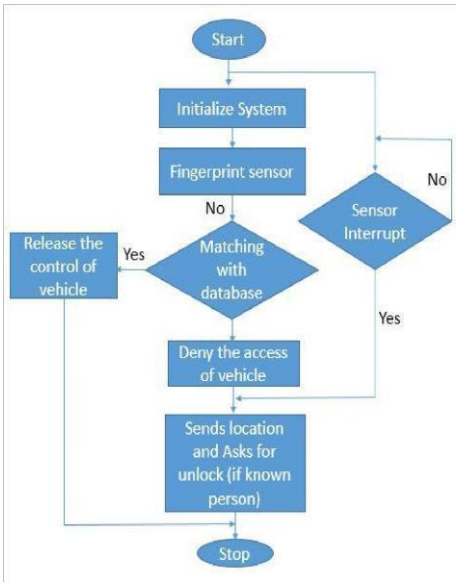


Fig 2: Flowchart For Proposed System

Above flow chart is explained in detail as follow in steps. Whenever a person tries to access the vehicle, the system will be turned on by the battery supply. Then the person should put the key on key holder and the Fingerprint Sensor is fixed near the key holder after the access of key. The fingerprint should be matched to start the vehicle's engine. The binary data of Authorized person's is already stored in the memory of Controller. Authorized person can be single or multiple.

V. RESULT

Fixed in Vehicle ***Device with User*** ***Access Granted*** ***Access Denied***

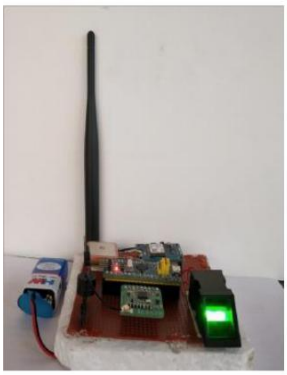
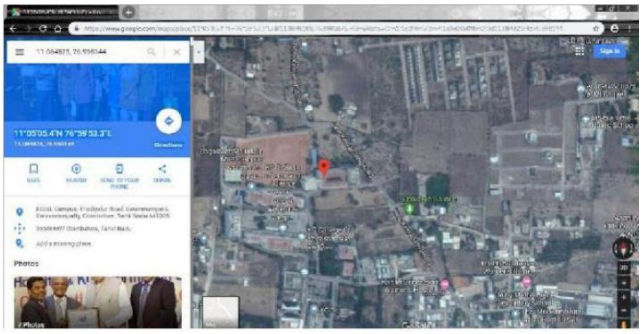


Fig 3: Transmitter *Fig 4: Receiver* Fig 5 :Access granted Fig 6 : Access denied

ALERT TO USER SHARES LIVE LOCATION **GOOGLE MAP TRACKS LIVE**



VI. COCLUSION AND FUTURE SCOPE

It is cost effective anti-theft system, which can be expected to reduce the automobile thefts, also Anti-theft security system can be installed in automobile easily. Because of this security system, it is too hard to an unknown person to access. Here an attempt is made to make a low-cost and excellent vehicle anti-theft control system which uses very low power supply Not only sending alert information, it also sends the live location of the car to the user and to the Internet cloud storage that we can access from anyplace to lock and unlock his/her vehicle. With this strong security mechanism it is initialized. The designing and implementation of a safety for vehicle was proposed. There are highest chances to reduce crime by this system.

The system can perform the real time monitoring of desired area and detect the theft with the good accuracy which is a step closer for us to improve our social security.

Our project can be improved as a future scope by giving machine learning to the system to identity the owner accurately without any interrupt.

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